DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY MATERIEL COMMAND
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AMC PAMPHLET NO. 25-32

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Information Management

GUIDE FOR PREPARATION OF EQUIPMENT PUBLICATIONS CONTRACT PACKAGES

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*This pamphlet supersedes AMC-P 310-4, 1 October 1985.

1. **PURPOSE AND SCOPE**. This pamphlet--

a. Establishes policy and provides guidance and procedures for the contractual application of requirements for the acquisition of paper technical manuals (TM)[1] electronic TMs (ETM), and interactive ETMs (IETM) by U.S. Army Materiel Command (AMC) personnel assigned responsibility for preparing TM contract packages, in whole or in part, for procurement purposes.

b. Serves as a handbook of information for project managers, contracting officers, or TM specialists who advise on, review, approve, or disapprove TM contract packages.

c. Provides sample contract language used for the acquisition of ETMs, IETMs and compact disc-read only memory (CD-ROM).

2. **REFERENCES**.

a. Required publications.

(1) AR 700-51 (Army Data Management Program). Cited in paragraphs 6 and 7.

(2) AR 700-70 (Application of Specifications, Standards, and Related Documents in the Acquisition Process). Cited in paragraph 5c.

(3) DoD 5000.19-L, Vol. II (Acquisition Management Systems and Data Requirements Control List (AMSDL)). Cited in paragraphs 5d(3), 5d(4) and 6c(3).

(4) DFARS (Department of Defense Federal Acquisition Regulation Supplement). Cited in paragraphs 5a, 5d, and 5f.

(5) FAR (Federal Acquisition Regulation). Cited in paragraph 5f.

(6) MIL-STD-1840 (Automated Interchange of Technical Information). Cited in paragraph 3a.

b. Related publications. Reference AMC Equipment Publications Procurement Document Control List, in addition to the following:

(1) MIL-D-28000 (Digital Representation for Communication of Product Data: Initial Graphics Exchange Specification (IGES) Application Subsets).

(2) MIL-M-28001 (Markup Requirements and Generic Style Specification for Electronic Printed Output and Exchange of Text).

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[1]The term technical manual, as used herein, is used generically to cover all equipment publications as defined in AR 25-30, chapter 6.

(3) MIL-R-28002 (Requirements for Raster Graphics Representation in Binary Format).

(4) MIL-D-28003 (Digital Representation for Communication of Illustration Data: Computer Graphics Metafile (CGM) Application Profile).

(5) International Standards Organization (ISO) 9660 (Information Processing - Volume and File Structure of Compact Disc-Read Only Memory (CD-ROM) for Information Interchange).

3. **EXPLANATION OF ABBREVIATIONS AND TERMS**. Abbreviations and special terms used in this pamphlet are explained in the glossary.

4. **COMPUTER-AIDED ACQUISITION AND LOGISTIC SUPPORT (CALS) COMPLIANCE/ COMPATIBILITY**. The manual(s) shall be delivered in one or more of the following formats and media:

a. CALS-compliant. When appropriate and affordable, TMs (paper, ETM or IETM) shall be CALS-compliant.

	Text	Graphics	
		Vector	Raster
File Formats	MIL-M-28001-compliant Standard Generalized Markup Language (SGML)-tagged American Standard Code for Information interchange (ASCII files embedded FSML graphics references	MIL-M-28003-compliant Computer Graphics Metafile(CGM)(preferred) or MIL-D-28000-compliant Initial Graphics Exchange Specifications (IGES) files	MIL-M-28002-compliant International Consultative Committee or Telegraphy and Telephony (CCITT) Group 4 Files

	Tape	CD-ROM
Media	MIL-STD 1840-compliant magnetic tape	International Standards Organization (ISO) 9660-compliant software and document data (volume and file structure) (See Appendix A for developing a CD-ROM application; see Appendix B for Sample SOW for acquiring a CD-ROM disc.

b. CALS-compatible. When cost or technical considerations make strict compliance infeasible, TMs (paper, ETM or IETM) shall be CALS-compatible. The formats and media of the deliverables shall be tailored to the technical capabilities of the intended user. Competition among software and media vendors shall be considered (i.e., accept as wide a variety of formats and media as possible). A sample statement of work (SOW) is provided at appendix A. Examples of popular formats and media follow:

	Text	Graphics	
		Vector	Raster
File Formats	Word Perfect 5.X	AutoCAD	TIFF
	Interleaf 5.3.X	MacDraw	PostScript
	MS Word/RTF	HPGL Plotter	Sun/XWindow Raster
	Multimate	Interleaf Graphics Format	Intran PIC

Media	Operating System	Size
Tape	Unix-compatible,tar format	3M DC6150 or equivalent quarter-inch cartrigde (QIC)
		EXABYTE 180181-000 or equivalent 8mm cartrigde
	SY-RTOS3.10CQ-A,running under MS-DOS 3.3 or later	3M DC6150 or equivalent quarter-inch cartrigde (QIC) only
Floppy Dis-Kette	UNIX-compatible,tar format	3.5 inch, high or low density
	MS-DOS 3.31 or later	3.5 inch, high or low density
		3.5 inch, high or low density

5. **BASIC ELEMENTS OF A TM CONTRACT PACKAGE.**

a. Contract line item number for TMs. Operation and maintenance instructions for weapon systems, weapon system components, and support equipment will be acquired via a contract line item number (CLIN) and contract exhibit(s). (Reference DFARS, part 4, subpart 4.71, for criteria.) (See figure 1 for sample.)

b. Statement of work. The SOW describes the work the contractor is required to do, and any actions the government is responsible for (such as providing source material and government-furnished equipment). (See appendix D for sample contract language to acquire ETMs, appendix E for IETMs and appendix F for digital files.)

c. Document summary list. The document summary list (DSL) tailors the requirements in applicable specifications/standards governing equipment publications acquisition. Tailoring of requirements shall be in accordance with AR 700-70 and shall be effected only through exclusion (deletion) of requirements that are not identified as mandatory. The content/format selection summary (CFSS) applies to the DSL as follows:

(1) If the specifications/standards contain a CFSS for tailoring optional requirements, that summary shall be selectively completed and included as an attachment to the DSL.

(2) If the specifications/standards do not have a CFSS, tailoring will be effected by appropriate exclusion of requirements as cited in the DSL.

d. Contract exhibit. (Reference DFARS, para 4.7105). "Exhibit" means a document attached to a procurement instrument, referenced by its capital letter identifier in a CLIN in the procurement instrument schedule. The exhibit sets forth as sequence line item numbers (SLIN) what would otherwise be shown as CLINs. The contract exhibit will fully describe SOW criteria, applicable approved specifications and standards, and delivery instructions. All documents and amendments, changes, or revisions to said documents, to be cited in the contract exhibit, shall have the following:

(1) Acquisition Management System Control (AMSC) approval numbers.

(2) Office of Management and Budget (OMB) clearance approval.

(3) A citation in the Acquisition Management System and Data Requirements Control List (AMSDL), DOD 5000.19-L, Vol II.

(4) A notation on the exhibit stating "TM requirements contained herein have been cleared for use by OMB No. (cite applicable number from the current AMSDL), expiration date of (day/month/year)."

(5) The procurement instrument identification number, exhibit identifier, and applicable CLIN cited on each page of the exhibit.

(6) A SLIN established for each separate TM or for each equipment publication type to be acquired.

(7) A list of SLINs established within the TM CLIN in the procurement instrument schedule for separate unit pricing of each TM deliverable identified in the exhibit (the CLIN line item entry in the schedule, itself, since it references an exhibit, shall not contain unit prices or total amounts in those columns at the CLIN entry).

(8) DD Form 1423 (CDRL) used as the TM CLIN exhibit media. This form may be generated electronically (see figure 2 for sample).

e. Attachments to contract exhibits. As applicable, attachments will be as follows:

(1) Attachment 1 - List of publications. List all publications to be acquired by the contract (if known). If publications requirements have not been determined by the time of contract negotiations, the contract will require delivery of a government-approved technical manual plan (TMP), which shall specify publications deliverables.

(2) Attachment 2 - List (matrix) of applicable specifications. List publication types across the top and specifications in the left column, with applicable columns marked with an "X."

(3) Attachment 3 - Delivery schedule. List the products to be acquired (i.e., updatable digital master file), the quantity (repro/proof copies), and shipping schedule.

(4) Attachment 4 - DSL including CFSS. (See paragraph c above.)

f. Contract clauses. A clause is a stipulation in a contract. (Reference the Federal Acquisition Regulation and DFARS for applicable clauses.) All contracts for TMs will include a clause stating that when the contractor no longer supports the contract, the codes (software) used to generate the TMs revert to the government.

6. **PREPARATION OF DD FORM 1423 USED AS AN EXHIBIT**. The following instructions supplement the instructions in AR 700-51 when the DD Form 1423 is used as a CLIN exhibit for acquisition (see figure 3 for sample):

a. In addition to information previously stipulated as required, the following data elements must be completed by the office having primary TM responsibility: 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 14, 15, and 16.

b. Each equipment publications deliverable to be acquired shall be identified as a separate SLIN entry on the DD Form 1423.

c. The following blocks on the DD Form 1423 shall diverge from AR 700-51 criteria, figure 3, as follows:

(1) Block 2. (Title or Description of Data)--Enter the basic title of the applicable TM (e.g., operator's manual, unit maintenance manual, etc.).

(2) Block 3. (Subtitle of Data)--Enter TM number.

(3) Block 4. (Authority, Data Item Number)--Cite the applicable specifications/standards number covering the TM being acquired. (Use an asterisk to indicate qualification to be specified in block 16, Remarks.) NOTE: Obtain the latest edition/amendment of the specification/standard from the current AMSDL or AMC Equipment Publications Procurement Document Control List.

(4) Block 5. (Contract Reference)--Enter the specific paragraph number in the SOW that will assist in identifying the TM product associated with the specifications/standards prescribed by block 4 above.

(5) Block 14. (Distribution and Addressees)--Enter the addressees and the number of copies (regular/reproducible) to be received by each. (Example: DDC - 20/0). Office symbols, contractor initials, or DoD Handbook H-4 numbers and command initials may be used. (A list explaining these codes shall be attached to the CDRL). If reproducible copies are required, explain in this field or use BLOCK 16, i.e., multilith mat, velium, negative, etc. If the data is not actually to be delivered to the Government or "associated contractors" or if deferred delivery is required per ASPR 9-202.2(f), indicate by placing the word "deferred" or similar remarks in this field.

(6) Block 16. (Remarks)--Specify basic detailed requirements paragraph and qualifications applicable to tailoring of the specifications/standards cited in block 4 (see also para 5c above), and reference applicable attachment number that details the tailoring.

7. **DD FORM 1423 USED TO ACQUIRE ADMINISTRATIVE/MANAGEMENT DATA VIA DD FORM 1664 (DATA ITEM DESCRIPTION (DID))**. The acquisition of TM program administrative/management data, such as TMP, validation plan, status reports, schedules, etc., shall be acquired by a DID and listed on a separate DD Form 1423 per
AR 700-51. The approval requirements cited in 5d(1), (2), and (3) above also apply to DIDs.

CONTINUATION SHEET	REFERENCE NO OF DOCUMENT BEING CONTINUED	PAGE OF PAGES

NAME OF OPERATOR OR CONTRACTOR

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
CLIN XXXX	EQUIPMENT PUBLICATIONS New, revised and changed DATMs, DMWRs, Commercial Manuals/Supplements, RPSTLs, and DMs for _____ System LAW the Equipment Publications SOW and Exhibit ___ consisting of the following sequence line items (SLINs XXXX-XXXX).			Offeror shall enter a separate price for each SLIN.	
	SLIN XXXX Operator/Organizational Technical Manual	1			
	XXXX DS/GS Technical Manual	1			
	XXXX Demilitarization Technical Manual	1			
	XXXX Depot Maintenance Work Requirements	1	LOT		
	XXXX Depot Manuals	1	LOT		
	XXXX Repair Parts and Special Tool List	1			
	XXXX Commercial Manuals/Supplements	1	LOT		
	XXXX OP/Org/DS/GS TM Changes	1	LOT		
	XXXX Changes to Commercial Manuals/Supplements	1	LOT		
	XXXX DMWR Change Pages	1	LOT		
	XXXX DM Change Pages	1	LOT		
	XXXX RPSTL Illustration Pages	1	LOT		
	NOTE TO PREPARER This is a sample, and may not reflect all equipment publication requirements. The SLIN sequence may be arranged at the discretion of the publications manager.				

SAMPLE

FIGURE 1. Sample - Contract line item number (CLIN) entry in procurement instrument schedule

ATCH NR 1 TO EXHIBIT TM01 — CONTRACT DATA REQUIREMENTS LIST — SYSTEM/ITEM AVIDDS

TO CONTRACTOR/PR _____ CATEGORY _____ CONTRACTOR _____

1 SEQUENCE NUMBER	2 TITLE OR DESCRIPTION OF DATA 3 subtitle	6 TECHNICAL OFFICE	10 FREQUENCY	12 DATE OF 1st SUBMISSION	14 DISTRIBUTION and ADDRESSEES
4 AUTHORITY (DATA ITEM NUMBER)	5 CONTRACT REFERENCE	7 DD 250 REQ	8 APP CODE (A)	9 INPUT TO 1AC (X)	11 AS OF DATE / 13 DATE OF SUBSEQUENT SUBMISSION
16 REMARKS					15 TOTAL
1. TM 01	2. TM Quality Assurance Plan 3.	6. AMSTA-MB	10. 1 Time	12. 45 DAC	14.
4. DI-M-2194 *	5. TM 01	7. DD	8.	9.	11. / 13.
16. * Contractor will prepare TM Quality Assurance Plan for government review in accordance with TM 01.					* AMSTA-MB 1/1
					15. 1/1
1. TM 01	2. Validation Plan 3.	6.	10.	12. 45 DAC	14.
4. DI-M-2195	5. TM 01	7. DD	8.	9.	11. / 13.
16. * Contractor will prepare validation plan in accordance with requirements of TM 01.					* AMSTA-MB 1/1
					15. 1/1

PREPARED BY _____ DATE _____ APPROVED BY _____ DATE _____

DD form 1423-E

PAGE 3 of 5 PAGES

SAMPLE

FIGURE 2. Sample - DD Form 1423 electronically generated.

Technical Manuals Requirements Contained Herein Hare
Been Cleared For Use By OMB No. 0704-0188. Exp Date Of 30 Jun 93

Exhibit B
DAAE-70-85-M-R267 CLIN XXXX

AMC-P 25-32

ATCH NR	TO EXHIBIT	CONTRACT DATA REQUIREMENTS LIST	SYSTEM/ITEM
	B		XYZ
TO CONTRACTOR/PR		CATEGORY	CONTRACTOR
		M	ABC

1. SEQUENCE NUMBER	2. TITLE OR DESCRIPTION OF DATA / 3. SUBTITLE	6. TECHNICAL OFFICE	10. FREQUENCY	12. DATE OF 1ST SUBMISSION	14. DISTRIBUTION AND ADDRESSEES (Addressee - Regular Copies/Repro Copies)	
4. AUTHORITY (Data Item Number)	5. CONTRACT REFERENCE	7. DD 250 REQ / 8. APP CODE (A) / 9. INPUT TO IAC (D)	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBM/EVENT ID		
1. A001	2. OPERATOR'S TECHNICAL MANUAL 3. TM 9-XXXX-XXX-10	6. AMXMD-EP	10. O TIME	12. DFDEL	14. AMXMD-EP PM NVEO	2/0 1/0
4. MIL-M-63036D(TM)*	5. SOW PARA 1.1.2	7. DD / 8. A / 9.	11.	13. 0		15. TOTAL 3/0
16. REMARKS BLOCK 4: PARA 3 OF MIL-M-63036D APPLIES, AS TAILORED BY ATTACHMENT A001AA FOR TECHNICAL CONTENT AND FORMAT. BLOCK 8: APPROVAL FOR TECHNICAL CONTENT AND FORMAT.						
1.	2. 3.	6.	10.	12.	14.	
4.	5.	7. / 8. / 9.	11.	13.		15. TOTAL
16. REMARKS						
1.	2. 3.	6.	10.	12.	14.	
4.	5.	7. / 8. / 9.	11.	13.		15. TOTAL
16. REMARKS						
1.	2. 3.	6.	10.	12.	14.	
4.	5.	7. / 8. / 9.	11.	13.		15. TOTAL
16. REMARKS						
PREPARED BY	DATE	APPROVED BY				DATE

SAMPLE

DD Form 1423E, SEP 86 — Previous editions are obsolete. — Page ____ of ____ Pages

FIGURE 3. Sample - DD Form 1423 used as an exhibit.

The proponent of this pamphlet is the United States Army Materiel Command. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Executive Director, USAMC Logistics Support Activity, ATTN: AMXLS-AP, Redstone Arsenal, AL 35898-7466.

FOR THE COMMANDER:

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Branch

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APPENDIX A

DEVELOPING A CD-ROM APPLICATION

1. **Software selection**. Each software application offers different features. Software selection will dictate the specific preparation required.

2. **Preparation**. Data preparation constitutes, by far, the largest percentage of effort. Many products allow you to index information for fast retrieval. However, these products do not perform quality assurance testing of your data.

BASIC STEPS TO CD-ROM PRODUCTION

a. Design & layout considerations.*

b. Data conversion.*

c. Quality assurance/spell checking.*

d. Data tagging (depends on the software).*

e. Data indexing.

f. Preliminary test on magnetic disk.

g. Logical formatting (into ISO/High Sierra format).

h. Premastering (error detection and logical formatting of disc).

i. Mastering - creating the master disc.

j. Reproduction - creating the plastic distribution discs.

* Separate, manpower intensive steps.

3. **Design**. Considerable forethought should be given concerning the end result of your application. Plans must include whether you will need many layers of a table of contents, automatic display of illustrations, retrieval by document or by paragraph, and positioning of images for fast retrieval. Considerations for choosing CD-ROM as an appropriate media should include the following:

a. What information needs to be distributed: software, data or both?

b. Platforms (i.e., 80386/80486, CGA/EGA/VGA, storage capacity, etc.).

c. Data preparation is the most difficult, most time-and labor-intensive part of a CD-ROM project. Remember the following points:

- Structure the data in a standard way, so later changes/enhancements can be handled using automated vice manual methods.

- Remember that, with 99.95 percent accuracy in the capture process, you can have 300k in data inaccuracies in a 600 Mb data base.

- Plan to test and retest the application before premastering begins. Once it is on the plastic disc, it is too late to change.

d. Determine image resolution requirements. While 300 dots per inch (DPI) is generally sufficient to print images, 75 DPI is more practical for screen images and takes less space. Plan resolution requirements with storage requirements in mind.

4. **Licensing**. Software licenses govern either the number of titles or the distribution quantity. The former is a less cumbersome business arrangement in that royalties do not have to be paid based on the number distributed.

5. **Premastering**. Premastering of information for CD-ROM may be acquired by the local command separately from disc replication.

6. **Mastering**. A CD-ROM is published like a phonograph record. In quantities of 500, the individual CD-ROM discs cost about $2.55. Glass mastering and replication of disc must be acquired through the U.S. Army Publication and Printing Command, from the Government Printing Office.

APPENDIX B

SAMPLE STATEMENT OF WORK FOR ACQUIRING A CD-ROM DISC

1. The contractor shall provide the following services:

a. Data preparation of approximately 12,000 pages of [name of proponent] publications and approximately 2,000 pages already on 5.25 disks in ASCII format using [name of index and retrieval software].

b. Quality control markup, and verification of the data to an accuracy in excess of 99.95 percent. Images should be captured in .PCX format. It shall be the responsibility of the contractor to build and include basic hyper-text links such as index and table of contents to all documents, mark documents, and hot-key directly to those documents' tables of contents. The contractor shall create hyper-text between and within the various [name of proponent] applications to show the functionality of the hyper-text feature within [name of index and retrieval software]. It shall be the responsibility of the contractor to coordinate with the proponent when questions arise concerning decisions on issues such as where hyper-text links will go, how exceptions in the data will be handled, etc.

c. The contractor shall be responsible for ensuring that the introduction screen, as shown on the demo disk provided to the contractor with the proper proponent identification, precedes the proponent-unique menu screens, which will be developed by the contractor.

d. As a minimum, the program shall be completely compatible with MS-DOS, IBM PC-DOS, versions 3.1 or higher. The program must be capable of operating fully within 440k of memory. This includes all processing necessary to display images.

e. The CD-ROM shall conform to the ISO 9660 (20 May 88) standard.

f. The contractor shall use [name/version of software] for index and retrieval, and shall provide full functionality available from this version of [name of software].

g. Image accuracy shall be managed per FIPS Pub 157.

(1) The system will incorporate machine readable publications, both text and image data, in an indexed and readily accessible form on CD-ROM in both stand-alone workstations and in a networked environment. If a publication is requested that is not available on the disc, a message will be displayed notifying the user about this.

(2) The hierarchial structure of [name of proponent] publications shall be preserved in the CD-ROM format, allowing users familiar with the publications to access via the hierarchy (e.g., everything within table of contents) as well as more sophisticated search techniques, using menuing screens as shown on Attachment 1 as a guide to develop these screens.

(3) Nontextual elements (tables and figures (where applicable), illustrations, etc.) shall be captured and stored as raster scanned images which are linked to the corresponding location(s) where mentioned within the text of the publications.

(4) The system shall provide the facility to add updated or additional collections to the users' system (single workstation or network system) through magnetic disk distribution. This information will be generated, formatted, indexed, and distributed through [name of proponent] facilities to augment the current CD-ROM database(s) between the CD-ROM publishing cycle.

(5) The software for the system must be able to be distributed on the CD-ROM for installation on individual users' computers.

h. The contractor shall not release any portion of the [name of proponent] CD-ROM disc under this contract to any party without prior written authorization from [name of proponent], nor shall the contractor use the data for any purpose other than that for which it was provided under the terms of this contract. Following the completion of this contract, all data in paper and electronic format (text in ASCII format with QML markup, on 5 1/4" 1.2MB, 3.5" 1.44MB floppy disks, cartridge tape or 9-track tape (as specified by the government) shall be returned to [name of proponent].

APPENDIX C
SAMPLE CONTRACT LANGUAGE FOR CALS-COMPATIBLE SUBMISSIONS OF ELECTRONIC DATA

3.4. Digitized delivery.

3.4.1. Scope. The contractor shall submit digitized text and graphics of technical publications procured under this SOW. The digitized data shall reflect the text and graphics contained in the camera-ready copy accepted by the Government; otherwise, it will be rejected.

3.4.2. Accepted media. Digitized data shall be submitted in one of the following media:

3.4.2.1. Magnetic tape cartridge:

3.4.2.1.1. 135-Megabyte (3M DC 6150 or equivalent), in either of the following tape formats:

3.4.2.1.1.1. SY-TOS Tape Operating System 3.10 CQ-A under MS-DOS 3.3 or later.

3.4.2.1.1.2. SunOS 4.1.1 or later dump format.

3.4.2.1.2. 2.3-Gigabyte (EXABYTE 180181-000 or equivalent), in SunOS 4.1.1 or later dump format.

3.4.2.2. Either of the following high-density floppy diskettes, not to exceed 10 diskettes per publication (i.e., larger publications must be submitted on tape):

3.4.2.2.1. 1.2 Megabyte 5.25-inch, DOS 3.31 or later.

3.4.2.2.2. 1.44 Megabyte 3.5-inch, DOS 3.31 or later or SunOS 4.1.1 or later.

3.4.3. Accepted formats.

3.4.3.1. Text. All text shall be submitted in ASCII, preferably tab delimited with linebreaks.

3.4.3.2. Graphics. Graphics shall be submitted in any of the following formats:

3.4.3.2.1. CGM (MIL-D-28003).

3.4.3.2.2. IGES (MIL-D-28000).

3.4.3.2.3. CCITT Group 4 (MIL-R-28002).

3.4.3.2.4. SUN RASTER FORMAT.

3.4.3.2.5. TIFF.

3.4.3.2.6. INTERLEAF graphics format.

3.4.4. Document naming and organization. There shall be a separate document for each chapter/appendix. Front matter shall be divided into separate documents for the cover; the warning page(s); and the table of contents (to include How to Use this Manual, List of Illustrations, and List of Tables). Documents shall be named as follows:

Narrative (non-RPSTL) Publications	
Publication cover	1cover
Warning Page(s)	2wng
Table of contents	3toc
How to Use This Manual	4howto
Chapters Chapter 1, pages 1 through 15 Chapter 1, pages 16 through 22	5chap1, 5chap2, 5chap3,... 51chap1 (pp.1-15) 52chap1 (pp. 16-22)
Appendices	Gappxa, Gappxb, Gappxc,...
Glossary	7gloss
Alphabetical Index	8index
Foldouts	9fo1, 9fo2, 9fo3,...

3.4.5. Changes only. Contractors shall request source tapes/diskettes through the contracting officer any time after contract award. (No source tapes/diskettes will be furnished prior to contract award.) The Government will respond within 60 days of written request.

3.4.5.1. With the request for source data, the contractor shall provide media conforming to paragraph 3.4.2. The contractor shall provide enough to store all requested publications; the Government will return any unused media with the source tape/diskettes.

3.4.5.2. The contractor shall specify in which of the following formats the source data should be furnished (select one for text and one for graphics):

3.4.5.2.1. Text.

3.4.5.2.1.1. ASCII.

3.4.5.2.1.2. MS WORD/RTF.

3.4.5.2.1.3. WORDPERFECT 5.1.

3.4.5.2.1.4. INTERLEAF 5.3.

3.4.5.2.2. Graphics.

3.4.5.2.2.1. CGM.

3.4.5.2.2.2. INTERLEAF 5.3 Graphics format.

APPENDIX D

SAMPLE CONTRACT LANGUAGE FOR ACQUIRING
ELECTRONIC TECHNICAL MANUALS (ETM)

(Extracted from the contract for M1 Abrams Tank supported by the Armored Vehicle Diagnostics Demonstration System (AVIDDS)).

6. **NARRATIVE ETM EQUIPMENT MANUAL DELIVERABLES**. Requirements of cited specifications and the following for deliverables shall apply:

a. Electronic Review Draft Copy (ERDC) Package. ERDC copies shall be delivered in quantity stated on DD Form 1423. The ERDC package shall include the following:

(1) A schematic representation of the ETM showing the program flow which will format and display required maintenance instructions and parts ordering information for use when faults found through troubleshooting and/or expert diagnostics require repair, adjust or remove/replace actions.

(2) A representation of the type(s) of file(s) used by the ETM to store narrative instructions, parts lists and associated illustrations; the type of electronic tagging, referencing or linking used by the ETM program to identify appropriate maintenance information and link it with associated information for display; and the tags, references or links which will cause that information to be formatted appropriately and displayed on the ETM computer's screen.

b. Electronic Preliminary Technical Manual (EPTM). The contractor shall deliver a validated EPTM which is representative of the final product. The EPTM will be programmed in a manner which allows its use for verification testing on the [designated display device].

c. Electronic Final Reproducible Copy (EFRC). The contractor shall deliver an EFRC which includes all changes and final resolutions resulting from Government reviews and tests as well as contractor quality review and final edit. EFRC shall conform to requirements for display on the [designated display device].

7. **PREPARATION INSTRUCTIONS**. The ETM(s) shall describe in detail the unit level maintenance procedures prescribed by the maintenance allocation chart (MAC) and source, maintenance and
recoverability (SMR) codes from the Logistics Support Analysis Records (LSAR) for unit maintenance of the [name of weapon system].

8. **REPAIR PARTS INFORMATION**. Repair parts information shall be accessible from repair task data screens.

a. Only those parts which are available at the unit level of maintenance and are repairable or replaceable will be referenced in the ETM. Authorized repair and dispose level references for components removed by the unit will be displayed at the request of the repairer.

b. When components removed at unit level are reparable at the same level, reference will be made to the appropriate instruction in the ETM and associated down parts will be displayed at that task.

9. **CLARIFICATION OF SPECIFICATIONS**. Requirements of the following paragraphs of the specifications are clarified as follows:

Specification	Para.	Requirement
MIL-M-63038C (TM)	3.1.5	[Address of proponent for 2028s]. Information must be available on one screen display and indexed for easy user discovery during ETM use.
MIL-M-63038C (TM)	3.1.8	Use of color is only limited by the display device's ability to portray colors. Color is allowed where it enhances usability and readability.
MIL-M-63038C (TM)	3.2.1e 3.2.1.5	Instructions on "How to use" can be embedded descriptions in the ETM or a separate section accessed by help routines. They should describe the use of help strips and methods to access referenced information from text or art screens.

Specification	Para.	Requirement
MIL-HDBK-63038-1A	Sec. 1 Sec. 2	TM format shall not have paragraph numbers or table numbers, and all internal references shall be through programming calls which run in a manner transparent to the user. User will not be asked to refer to "pages," "screens," "paragraphs," figures" or any other form of referencing used in paper-based publications to obtain information.
MIL-HDBK-63038-1A	Sec. 1 Sec. 2	Chapter indexes will not be used. Where applicable, in 'Page Turner' ETMs, chapter indexes, paragraph numbers, table numbers, etc. will be 'Hot Spotted' on pages that have been scanned in as graphics.

APPENDIX E

SAMPLE OF CONTRACT LANGUAGE USED FOR ACQUIRING INTERACTIVE ELECTRONIC TECHNICAL MANUALS (IETM)

(Extracted from contract for the Unmanned Aerial Vehicle (UAV))

ELECTRONIC TECHNICAL PUBLICATIONS.

1. Technical application. The contractor shall develop, maintain, and deliver technical application for the UAV. Application shall be developed for the explicit purpose of supporting a pageless IETM. Application is to be designed to be displayed on a Government approved portable maintenance aid. The contractor will author the IETM using government-furnished equipment (GFE) software described below and delivered on MIL-STD-1840 magnetic media IAW the provisions of this SOW and the specifications of contract exhibit C. The contractor shall also prepare technical publications reports IAW DI-FNCL-80912 and DI-M-6155, as specified in exhibit C.

2. Government-furnished equipment software description. The contractor shall be furnished with the IETM authoring tool Interactive Authoring and Display System (IADS) for the production and display of ETMs. Information can be created using IADS, or it can be imported from other sources using CALS data interchange file formats. Interactive authoring display system uses SGML-tagged text as its internal file format. The text is formatted for screen display using rules defined by a stylesheet. The stylesheet is definable by the author/technical writer; however, [name of proponent] will establish a standard set of stylesheets to ensure consistency for all IETMs. [Name of proponent] will also establish a baseline tag set of SGML tags to be used in authoring textual information. The contractor can use IADS or other software to create SGML-tagged text files which conform to the [name of proponent] specifications.

3. Authoring hardware platform requirements. The contractor will need an 80386 or 80486 personal computer with at least 4 megabytes of RAM (8 megabytes preferred), VGA or higher resolution monitor, mouse (optional but highly recommended for ease in authoring), and at least a 120-megabyte or larger hard drive.

4. Authoring software platform requirements. The contractor will need DOS 4.1 or later release and Microsoft Windows 3.0 to run IADS.

5. Government-furnished equipment software. Draft GFE software will be provided for review NLT 30 days prior to contract award. Final software will be provided within 60 days after contract award.

6. Copyright and proprietary material. Application shall not contain copyright material unless a release has been obtained. Copies of copyright releases shall be furnished to the contracting officer. When the contractor cannot obtain copyright releases, the contracting officer shall be notified by letter. Application shall not contain proprietary material.

7. Effectivity.

a. The application shall reflect all active configurations of the hardware.

b. The application shall reflect the maintenance concept/philosophy established for the target audience and reflected in the Government-approved LSA/LSAR and other source data (i.e., maintenance allocation charts (MAC) and source, maintenance, and recoverability (SMR) codes).

c. For repair parts and special tools lists (RPSTL), new illustrations shall reflect the equipment delivered to the Government and/or modified for the Government. Provisioning lists (PL), approved engineering drawings, design change notices (DCN), and letters of instruction (LOI) shall determine the parts to be illustrated. All illustrations shall be developed IAW the requirements of this SOW regarding size, display density, and legibility.

8. Start-of-work meeting. An applications start-of-work meeting shall be held not later than 30 days after contract award. This meeting may be scheduled to coincide with an ILS Management Committee meeting. The contractor shall present at this meeting a brief synoptic outline of all applications to be developed. A specification interpretation review will be held at the meeting if the Government and contractor determine that such a review is needed.

9. Reviews, validation and verification requirements.

a. In-process deliveries.

(1) Formal delivery of application shall be done on a quarterly basis during preparation of draft application. The contractor shall deliver application IAW the CALS requirements of MIL-STD-1840. Specifically, the illustrations shall be in CGM standard according to MIL-D-28003. No illustration shall require display dimensions of greater than 8.5 x 11 inch for full legibility at a twenty-four inch (24") viewing distance. Text shall be delivered IAW SGML standard MIL-M-28001. Tags and DTDs utilized for text will be provided as Government-furnished information (GFI). All initial deliveries will be submitted to the CALS Test Network (CTN) for approval before submission to the Government (30-day turnaround). All CTN comments/corrections will be incorporated by the contractor before submitting the delivery to the Government. Further submission to the CTN will be at Government direction. Government signed comments, exceptions, and waivers will be furnished to the contractor within 30 days after acceptance of the

delivery. The contractor shall incorporate Government comments and shall retain copies of the comments for use in future reviews.

(2) Repair parts and special tools list application. The contractor shall prepare draft RPSTL illustrations to reflect the current equipment configuration per approved engineering drawings, as scheduled for tactical deployment, and IAW MAC and SMR codes. The illustrations shall show every item which can be removed and replaced without destruction of the next higher assembly IAW the specifications as tailored in the DSL. Illustrations are to be available 15 days prior to provisioning conference and in conjunction with IPRs. Repair parts and special tools list data shall be provided on a 9-track, 1/2 inch magnetic tape, 1600 or 6250 BPI, IAW the CDRL. Reviews shall be performed as directed by the technical representatives. Signed comments resulting from the IPR will be furnished to the contractor at the conclusion of the IPR. The contractor shall make available the following materials for each IPR:

(a) Each illustration (new, changed, or revised).

(b) A complete database of data associated with each illustration as well as all other available RPSTL data.

b. Presubmittal Review. This review will be performed by the technical representative prior to preparation of final material to ensure that all previous review comments have been incorporated and that file and media formats are IAW specifications cited in paragraph 9.4.6 of this SOW. At least 15 days prior to the availability of the material for this review, the contractor shall notify the publications control officer with a copy to the technical representative of the date on which the material shall be available; the date and location of the review will be determined by the technical representative. The review shall be performed at the contractor's facility, or the material shall be furnished to the Government. The contractor notification shall include the approximate quantity of material to be reviewed and the identification number(s) of the equipment being covered. If the material is delivered to the Government, the technical representative will complete the review within 60 days after receipt of the material. The following material shall be made available for this review:

(1) One complete set of deliverable media IAW this SOW and MIL-STD-1840 and its tailoring documentation:

(a) Text.

(b) Art, both that associated with the RPSTL data base and that associated with the maintenance and operations procedures.

(c) RPSTL data base.

(2) A record of signed comments and engineering change proposals/ modification work orders incorporated with indication of the portions of the submitted materials which reflect incorporation.

(3) A record of all signed comments to be incorporated in the final material.

(4) Specific comments resulting from the presubmittal review will be furnished to the contractor after the check is completed. The contractor shall incorporate all comments furnished by the technical representative into the final material.

c. Validation of application for IETMs shall be in accordance with paragraph 4.5 of MIL-M-63036 and paragraph 4.6.1 through 4.6.1.3 of MIL-M-63038. The contractor shall prepare a validation completion report IAW DI-TMSS-80070.

d. Verification. Unless otherwise advised in writing through the contracting officer, verification by the Government will be IAW paragraph 4.6 of MIL-M-63036 and paragraph 4.6.2 of MIL-M-63038.

10. Delivery media and formats.

a. All final technical applications created and delivered under this SOW shall be provided as MIL-STD-1840-compliant magnetic media and as directed within this SOW and tailoring documents.

b. Text files shall be developed IAW MIL-M-28001 and shall be delivered as MIL-STD-1840-compliant SGML ASCII text files with embedded SGML graphics references utilizing the tag set provided as Government-furnished information (GFI).

c. Vector graphics shall be developed IAW MIL-D-28003 as tailored. No illustration shall exceed an 8.5 by 11 inch display size in a landscape orientation or require a display resolution in excess of 640 (horizontal) by 480 (vertical) pixels. All such illustrations shall be legible at that resolution at a viewing distance of 24 inches.

d. Raster-scanned graphics which comply with MIL-R-28002, delivered as MIL-STD-1840-compliant CCITT, Group 4 files shall accompany the vector files for archival purposes.

e. Interactive ETMs will be authorized using the GFE software IADS and will be submitted to the CTN for approval before submission to the government. Further submissions to the CTN will be at government discretion.

f. All deliverable tapes shall be nine-track, 1600 or 6250 BPI, and specified as to BPI and blocking factor used. Initial deliveries of each kind of file under this SOW shall be accompanied by printed representations of the first and last files on the tape for media verification.

11. Final acceptance review.

a. A review of final material will be performed by the technical representative at [name of proponent] to ensure that final material meets the requirements of this SOW and related specifications. The official final acceptance of material shipped under this SOW will be made by the contracting officer by returning a signed copy of the DD Form 250 to the contractor. Final acceptance review will be completed within 45 days after receipt of the material by the technical representative, to be delivered as specified in section F of the contract, unless the material is rejected. New, changed, or revised applications submitted for final acceptance will be accepted if the following criteria are met:

(1) Application is prepared and finalized IAW the applicable specifications, review comments, LOIs from the technical representative, and instructions cited in this SOW.

(2) The submitted material contains no technical errors.

(3) Delivery format and media are compliant with the requirements of this SOW and its tailoring.

Exhibit C
Enclosure 1 to
Attachment 2

AUTOMATED IPR DATA FORMAT

RPSTL for IPRs and Final Deliverables shall be formatted in accordance with the following information:

1. All fields shall be left justified and padded with spaces as necessary. There shall be no spaces between fields.

2. Media shall be a 9-track 1/2 inch magnetic tape, 1600 or 6250 bytes-per-inch (bpi) in EBSDIC character set in ANSI format.

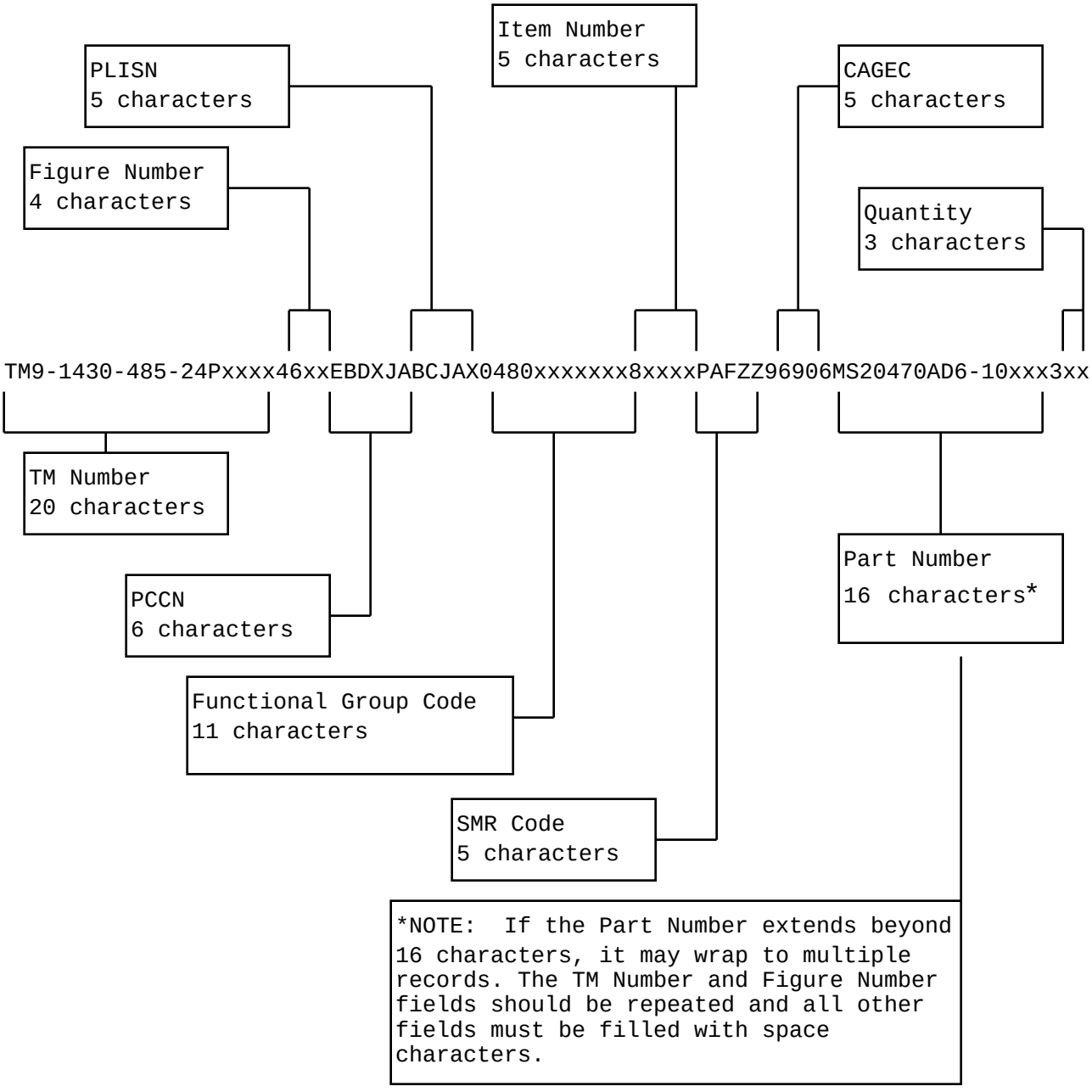
3. Total characters in the record shall be 80 characters.

Description of Format:

FIELD NUMBER	FIELD CONTENTS	WIDTH (IN CHARACTERS
1	TM Number	20
2	Figure Number	4
3	PCCN (Provisioning Contract Control Number)	6
4	PLISN (Provisioning Line Item Sequence Number)	5
5	FGC (Functional Group Code)	11
6	Item Number	5
7	SMR Code (Source, Maintenance and Recoverability)	5
8	CAGEC (Commercial and Government Entity Code)	5
9	Part Number	16*
10	Quantity	3

*NOTE: If the part number extends beyond the 16 character limit, it may wrap to multiple records. The TM Number and Figure and Item Number fields shall be repeated and all other fields filled with space characters.

Exhibit C
Enclosure 2 to
Attachment 2



RECORD FORMAT FOR AUTOMATED IPR DATA. For readability the lower case x characters in the sample record represent the location of blank space characters (ANSI 32 decimal).

MATRIX OF APPLICABLE SPECIFICATIONS

Documentation Category:	TM	RPSTL
Specification		
MIL-M-28001	X	X
MIL-R-28002	X	X
MIL-D-28003	X	X
MIL-M-38784	X	X
MIL-M-49502		X
MIL-M-63002	X	X
MIL-M-63036	X	
MIL-M-63038	X	
MIL-STD-1840	X	X
MIL-Q-87270	X	X
MIL-D-87269	X	X
MIL-M-87268	X	X
MIL-STD-361	X	X

NOTE: These specifications are to be tailored in accordance with the Document Summary List. A specification interpretation review will be held of the Government and contractor determine that such a review is needed.

Sample Acquisition Requirements

MIL-M-87268	IETM General Content, Styles, Format, and User-Interaction Requirements Category 1	20 Nov 92

Ordering data for paragraph 6.2 is as follows:

a. Manuals, Interactive Electronic Technical: General Content, Style, Format, and User-Interaction Requirements, 20 November 1992.

b. DODISS citing is not required.

c. Skill level will be provided by procuring activity in SOW.

d. Specification of end user shall be IAW paragraph 3.3.1.

e. Expert user may access information at the novice level. The novice user may not access information at the expert level. Procuring activity shall provide the criteria to determine the target skill level for expert.

f. Nomenclature will be IAW paragraph 3.3.4.4.

g. Conversion of U.S. standards of measurement to metric standards is not required.

h. A permitted word list will not be used.

i. The least capable device to be supported by the IETM will be the CTS III.

j. Multiple windows, as provided by IADS, will be used.

k. Additional window controls are required as provided by IADS.

l. Standard viewing distance of graphics will be at 24 inches.

m. Footer bar shall be IAW paragraph 3.6.1.3.3.

n. No message area is required in the display window.

o. No additional system functions are required.

p. Schematic and wiring diagrams will be IAW paragraph 3.3.5.12.

q. Step numbering shall be IAW paragraph 3.6.1.3.3.

MIL-D-87269 Revisable Data Base For Support of IETMs Category 1 — 20 Nov 92

Ordering data for paragraph 6.2 is as follows:

a. Data Base, Revisable: Interactive Electronic Technical Manuals, For The Support Of, 20 November 1992.

b. DODISS citing is not required.

c. A DTD will be provided by the procuring activity.

d. IETMDBs will be tagged IAW DTD provided by the procuring activity.

e. Structure and data elements shall be IAW DTD provided by procuring activity.

f. Specific DTD provided by the procuring activity will be used instead of those specified in this military specification.

MIL-Q-87270 Quality Assurance Program for IETMs and Associated Technical Information Category 1 — 20 Nov 92

Ordering data for paragraph 6.2 is as follows:

a. Quality Assurance Program: Interactive Electronic Technical Manuals and Associated Technical Information; Requirements for, 20 November 1992.

b. DODISS citing is not required.

c. Quality assurance plan (QAP) shall be IAW paragraph 3.1.

d. Delivery of a QAP shall be IAW paragraph 3.2.

e. Contractor shall have access to GFE.

f. Validation will be IAW paragraph 3.6.1.

g. IETMDB will be part of the IETM procurement.

h. IADS will be used for displaying IETM.

i. Files shall be parsed against the provided DTD.

APPENDIX F

SAMPLE CONTRACT LANGUAGE FOR ACQUIRING ELECTRONIC (DIGITAL) PUBLICATIONS FILES

1. **PREPARATION INSTRUCTIONS**. Contractor shall provide the Government digital files of the equipment publications as specified on DD Form 1423. Standards for each type of deliverable required are as follows; however, essential contractor requirement is that deliverables be fully compatible with Government hardware and software.

a. Processable file, ASCII text with SGML tagging for narrative instructions (refer to MIL-M-28001).

(1) Format: Delimited ASCII text including narrative instructions and reference pointers from those instructions to related files.

(2) Delivery media: (state the requirements of the operating system to be utilized for acceptable delivery.)

(3) Description: Each disc labeled with publication description, date of file creation, and file type.

b. CGM Vector Graphics (see MIL-M-28003).

(1) Format: Image of each required illustration linked with ASCII reference pointers to related files.

(2) Delivery media: (state the requirements of the operating system to be utilized for acceptable delivery.)

c. American Standard Code for Information Interchange (ASCII) Processable Text File. Composed Document: Sequential text of the whole publication, each task a separate field.

2. **SPECIFICATIONS**.

MIL-STD-1840, Automated Interchange of Technical Data, shall apply. Offerors will respond to the latest version at the date of contract award.

MIL-M-28001, Standard Generalized Mark-up Language. Offerors will respond to the latest version at the date of contract award.

MIL-M-28003, Computer Graphics Metafile. Offeror will respond to the latest version at the date of contract award.

3. **SPECIAL PROVISIONS**. Original digital source files used by contractor in preparation of an equipment publication shall be retained by the contractor until warranty of data for applicable publication has expired.

4. **DELIVERY SCHEDULE**. As specified on DD Form 1423.

5. **IN-PROCESS REVIEW**. The contractor shall provide the government with a sample of required digital deliverable covering a portion of equipment publication in process to allow the government to print the contents using government equipment and software and test compatability.

6. **VALIDATION**. Contractor shall assure completeness, clarity, and usability of digital products prior to delivery to the government.

7. **VERIFICATION**. Government will print contractor-supplied digital file at government site to assure acceptability. Government reserves the right to use sampling to verify contractor validation of digital file deliverables.

8. **PACKAGING**. Contractor is responsible to ensure that the digital file be sent using the best commercial practice in packaging this specific type of media.

a. A packing slip showing the names and volume numbers of each tape or disk shall be included in each package.

b. Encoded magnetic computer tape or disk shipping containers shall be conspicuously labeled with a warning tag as identified in MIL-STD-1840. The exterior container used to transport digital data will be labeled in accordance with MIL-STD-1840.

GLOSSARY

Section I. Abbreviations

AMSC	acquisition management system control
AMSDL	acquisition management system and data requirements control list
ANSI	American National Standards Institute
ASCII	American standard code for information interchange
AVIDDS	armored vehicle diagnostics demonstration system
BPI	bytes-per-inch
CAGEC	commercial and Government entity code
CALS	computer-aided acquisition and logistic support
CCITT	International Consultative Committee on Telegraphy and Telephony
CDRL	contract data requirements list
CD-ROM	compact disc-read only memory
CFSS	content format selection summary
CGA	color graphics adapters
CGM	computer graphics metafile
CLIN	contract line item number
CTN	CALS test network
DCN	design change notice
DFARS	Department of Defense federal acquisition regulation supplement
DID	data item description
DODISS	Department of Defense, Index of Specifications and Standards
DOS	disk operating system
DPI	dots-per-inch
DSL	document summary list
DTD	document type definition
ECP	engineering change proposal
EFRC	electronic final reproducible copy
EGA	enhanced graphics adapters
EPTM	electronic preliminary technical manual
ERDC	electronic review draft copy
ETM	electronic technical manual
FAR	federal acquisition regulation
FCS	fire control system
FGC	functional group code
FOSI	formatting output specification instance
GFE	government-furnished equipment
GFI	government-furnished information
IADS	interactive authoring and display system
IAW	in accordance with
IETM	interactive electronic technical manual
IGES	initial graphics exchange specification
ILS	integrated logistic support
IPR	in-process review

ISO	International standards organization
LOI	letter of instruction
LSA	logistic support analysis
LSAR	logistic support analysis record
MAC	maintenance allocation chart
MB	megabyte
MWO	modification work order
OMB	Office of Management and Budget
PCCN	provisioning cost control number
PL	provisioning list
PLISN	provisioning line item sequence number
QAP	quality assurance plan
RAM	random-access memory
RPSTL	repair parts and special tools list
SGML	standard generalized markup language
SLIN	sequence line item number
SMR	source, maintenance, and recoverability
SOW	statement of work
TM	technical manual
TMP	technical manual plan
USAMC	U.S. Army Materiel Command
VGA	video graphics adapters

Section II. Terms

ASCII text. ASCII text is the most generic of all representations of text in computer code. ASCII text currently can be transferred between most hardware and software. Its format is basically limited to spaces and punctuation.

CALS. A DOD and industry strategy to enable and to accelerate the integration of digital technical information for weapon system acquisition, design, manufacture, and support. CALS provides for an effective transition from current paper-intensive weapon system life cycle process to efficient use of digital information technology.

CD-ROM. A 12 cm (4") polycarbonate disc used for government library data storage and retrieval. It drastically reduces the physical storage space typically required of large databases, provides cost savings for mailing, unrestricted access to large data bases, and anticipated shelf life between 10 to 50 years.

CGM. A two-dimensional vector graphics standard.

ETM. CALS-compatible electronic representation of the instructions for the installation, operation, maintenance, training, and support of weapon systems, weapon systems components, and support equipment. The digital information is stored on magnetic or optical media and used in conjunction with a weapon system processor, a portable maintenance aid or an approved computer system.

IADS. A Microsoft Windows application which uses SGML as the internal file format for textual data. Both vector and raster graphics are supported through the CALS standard formats MIL-D-28003, CGM, and MIL-R-28003, Raster Type I, as well as other industry standard formats. IADS documents are presented on screen in full color with support for a wide range of high quality fonts.

IETM. A technical manual prepared in digital form on a suitable medium, by means of an automated authoring system; designed for electronic screen display to an end user. The presentation format is "frame-oriented", not "page-oriented" and the user's access to information is achievable by a variety of paths. The computer-controlled IETM display device can function interactively as a result of user requests and information input.

IGES. A three-dimensional, international standard for technical illustrations/engineering drawings.

ISO 9660. The volume and structure standard written specifically for CD-ROM. Allows the CD-ROM player to be read/addressed like any other write-protected DOS device. Allows for portability among devices/hardware that conform to the ISO standard.

Raster image. An image created by modulating equally spaced horizontal lines. In a digital raster image, the horizontal lines are broken into many regularly spaced dots or pixels that are represented as light or dark. With raster images, a vast amount of digital data is required for each graphic.

SGML-tagged ASCII test. Format and style information added to ASCII files by adding "tags" or programming commands along with ASCII text. One such set of tags is the SGML. ASCII text with SGML tags is the neutral format for text prescribed by CALS.

Vector graphics. Graphic objects recorded by mathematical notation by points, lines and shapes. A drawing will consist of a collection of objects instead of recording every dot, or absense of a dot, that it would take to describe that object. Vector drawings can be enlarged, or reduced to any extent without altering the resolution or granularity of the image. It also produces smaller file sizes and is far more manipulative than raster images.